WHAT IS CLAIMED IS:

1. A method for radix-2 fast fourier transform on a digital series to produce signals in cyclically noncontinuous output bins, comprising the steps of:

determining the number 2^S of FFT points, the output bin index O_S, and the input signal array;

determining the butterfly index for the last stage by

$$\Psi_{S-1} = O_S \,\%\, (\frac{N}{2}) \qquad (9)$$

determining the butterfly index for each stage other than said last stage by

$$\Psi_{\ell-1} = \Psi_{\ell} \,\%\, (\frac{N}{2^{S-\ell+1}}) \qquad (10)$$

where ℓ varies from 1 to (S-1);

using said butterfly index, calculating only those butterflies necessary for calculation of the output bins.

2. A method according to claim 1, wherein said step of determining the butterfly index for all later stages is performed in numerical order.

3. A method according to claim 2, wherein said numerical order is ascending order.

4. A method according to claim 1, further including the determination of output bins by the additional steps of:

for stage ℓ, where ℓ varies from 1 to S, executing only that butterfly in the butterfly index set $\Psi_{\ell-1}$ of that stage;

for stage ℓ, loading the twiddle factor corresponding to the butterfly index set $\Psi_{\ell-1}$ of that stage; and

repeating the steps of (a) executing only that butterfly in the butterfly index set $\Psi_{\ell-1}$ of that stage and (b) loading the twiddle factor corresponding to the butterfly index set $\Psi_{\ell-1}$ of that stage, until the required final stage butterflies are executed and the required output bins are filled.

5. A method according to claim 1, wherein said step of using said butterfly index includes the further steps of:

setting the butterfly index set Ψ_j where $(1 \leq j \leq S-1)$ and the selected output node index set ranges from O_S to M_S^i by

(a) for $(1 \leq j \leq S-1)$

(i) if $(k \in \Psi_j)$ or Ψ_j contains index k, then setting $m_j^k = 1$.

(ii) if $(k \in \Psi_j)$, then setting $m_j^k = 0$.

(b) for $j = S$

(i) if $(k \in O_S)$, or O_S contains index k, then setting $m_j^k = 1$.

(ii) if $(k \notin O_S)$, then setting $m_j^k = 1$; and

Controlling of a memory pair stage j by m_j^i $(0 \leq i \leq 2^{j-1}-1)$ and m_j^{i+Y}, $(Y = 2^{j-1})$.

6. A method according to claim 4, wherein said step of setting the butterfly index includes the steps, when $0 \leq i \leq (2^{j-1}-1)$, of:

controlling the butterfly adder with m_j^i;

controlling the butterfly subtractor with m_j^{i+Y}; and

controlling the butterfly multiplier in accordance with the Boolean OR of m_j^i and m_j^{i+Y}.